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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/714,426	11/16/2000	Thomas C. McDermott III	59182-P005US-10020642	4152

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EXAMINER	
TON, ANTHONY T	

ART UNIT	PAPER NUMBER
2661	3

DATE MAILED: 03/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/714,426	MCDERMOTT ET AL.	
	Examiner	Art Unit	
	Anthony T Ton	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 November 0200*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 November 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTIONS

Specification

1. The disclosure is objected to because of the following informalities:

Term "**N-to-one**" shown in page 10 line 14 is not appropriate. Examiner suggests changing this term to "**one-to-N**".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 1-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Lyles** (US Patent No. 5,305,311) in view of **Honig et al.** (US Patent No. 6,487,171).

a) **Regarding to Claim 1: Lyles disclosed** a network router system comprising:

an optical switching fabric having multiple inputs and multiple outputs connected through multiple switching paths *[see Fig. 10: 106 and 104; and Fig.2: 41]*;

multiple input line cards interconnected with said multiple inputs of said switching fabric *[see Fig.2: link In 84; and col.12 line 65 – col.13 line 1, line card logic includes the input and output links 84 and 85, respectively]*;

multiple output line cards interconnected with said multiple outputs of said switching fabric *[see Fig.2: link Out 85; and col.12 line 65 – col.13 line 1, line card logic includes the input and output links 84 and 85, respectively]*;

a dedicated multicast output card interconnected substitutionally for said output line card with at least one said switch fabric output *[see col.4 line 58 – col.5 line 2, copy network 48 (considered as the dedicated multicast output card)]*; and

a dedicated multicast input card interconnected substitutionally for said input line card with at least one said switch fabric input, such that said dedicated multicast input card is connected with said dedicated multicast output card through a data path and such that said dedicated multicast input and output cards have no facility interface connection *[see Fig.2: copy Net 86 (considered as a dedicated multicast input card); and col.11 line 63 – col.12 line 12, N x N copy network 48 (dedicated multicast output card)]*.

Lyles failed to explicitly teach a plurality of facility interface cards disposed such that each of said multiple input and output cards is interconnected with a facility interface card. *[However, Lyles specifically disclosed a network interface of workstations and other computers such as sources 31 and 32 in a LAN shown in Fig.1 see col.13 lines 27-33]*.

Honig et al clearly taught such a plurality of facility interface cards *[see Fig.4: I/F card #1 to I/F card #N in box 52]*. **Therefore, it would have been obvious** to one of ordinary skill in the art at the time of the invention was made to provide such a plurality of facility interface cards disposed such that each of the multiple input and output cards is interconnected with a facility interface card throughout the network

interface of **Lyles**, as taught by **Honig et al.** for functioning to couple data from/to physical interface to/from the input and output line cards, **the motivation being** able to provide a successful transfer of a multicast packet to appropriate destinations.

b) **Regarding to Claim 2**: **Lyles disclosed** the router system of claim 1 wherein said dedicated multicast input card, said dedicated multicast output card, and said data path are combined into a single dedicated multicast card *[see col.16 lines 36-57, the copy network 48 on a single board or card].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1**.

c) **Regarding to Claim 3**: **Lyles disclosed** the router system of claim 1 wherein said optical switching fabric is partitioned into a plurality of working subplanes *[see Fig.1: Switches 1-3 from Source 1 to Destination; this configuration can be considered as the optical witching fabric is partitioned into a plurality of working subplanes].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1**.

d) **Regarding to Claim 4**: **Lyles disclosed** the router system of claim 1 further comprising a plurality of said dedicated multicast input cards and a plurality of said dedicated multicast output cards, such that each said multicast input card is connected with one said dedicated multicast output card *[see col.4 lines 58-62, incoming multicast cells; and see col.12 lines 26-34, at least one, and perhaps many, of the outputs of each of the crossbar in the first layer is connected to inputs on each crossbar chip in the second layer].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

e) **Regarding to Claim 5**: **Lyles disclosed** the router system of claim 1 wherein said optical switching fabric contains multiple inputs and multiple outputs connected through multiple parallel switching paths *[see col.14 lines 42-52, parallel data path structure of the switching fabric 41].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

f) **Regarding to Claim 6**: this claim is rejected for the same reasons as Claim 1 because the apparatus in Claim 1 can be used to practice the method steps of Claim 6.

g) **Regarding to Claim 7**: this claim is rejected for the same reasons as Claim 2 because the apparatus in Claim 2 can be used to practice the method steps of Claim 7.

h) **Regarding to Claim 8**: **Lyles disclosed** the method of claim 6 wherein said multicast packet is transferred to said dedicated multicast output card through said optical switching fabric *[see col.4 lines 58-62, incoming multicast cells are routed around the copy network and through switching fabric 41, but then are intercepted at the output of the switching fabric and returned to the copy network 48 (dedicated multicast output card), rather than being routed to outgoing lines].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

i) **Regarding to Claim 9**: **Lyles disclosed** the method of claim 6 wherein said multicast packet is converted from an optical packet to an electrical packet at said dedicated multicast output card *[see col.2 lines 59-62, optical fiber; col.3 lines 6-19,*

operating at link rates of 155 Mbps (hence OC-3); and see col.7 lines 44-48, electrical loads (at Reservation Ring 46 in Fig.2, hence electrical packet)].

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

j) **Regarding to Claim 10: Lyles disclosed** the method of claim 6 wherein said multicast packet is replicated to produce a replica packet *[see col.1 line 64 – col.2 line 12, multicast packets, separate copies of each of said packets].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

k) **Regarding to Claim 11: Lyles disclosed** the method of claim 10 wherein said replica packet is produced at a location selected from the group consisting of said dedicated multicast output card and said dedicated multicast input card *[see col.1 line 64 – col.2 line 12, copy groups composed of multiple ones of said destinations].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

l) **Regarding to Claim 12: Lyles disclosed** the method of claim 6 wherein said multicast packet is converted from an electrical packet to an optical packet at said dedicated multicast input card *[see Fig.2: Reservation Ring 46 and Switching Fabric 41 (wherein the 41 is a combination of Batcher 42, Banyan 43 and 44; in which, the 46 is operating at electrical loads, whereas the 41 is operating at link rates (OC-3, hence optical)); therefore, from an electrical packet to an optical packet].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

m) **Regarding to Claim 13**: **Lyles disclosed** the method of claim 6 wherein said multicast packet is transferred from said dedicated multicast input card to said multiple outputs through said optical switching fabric *[see col.16 lines 6-14, for each of the j cells (copied (multicast) cells), the subsequent processing steps are identical a unicast cell, through the switching fabric 41].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

n) **Regarding to Claim 14**: **Lyles disclosed** the method of claim 6 wherein said multicast packet is transferred to said multiple outputs serially over a period of multiple switching cycles of said optical switching fabric *[see Fig.2: 52, 51 and 45 (these are FIFO buffers; therefore, a multicast would be serially transmitted to the multiple outputs 85);and see col.8 lines 3-68, at the beginning of each arbitration cycle in line 7 and additional switch cycles in line 68 (multiple switching cycles)].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

o) **Regarding to Claim 15**: **Lyles disclosed** the method of claim 10 wherein said optical switching fabric contains multiple inputs and multiple outputs connected through multiple parallel switching paths *[see col.14 lines 42-52, parallel data path structure of the switching fabric 41].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

p) **Regarding to Claim 16**: **Lyles disclosed** the method of claim 15 wherein multiple replica packets are transferred in parallel to said multiple outputs during a single cycle of said optical switching fabric *[see col.17 lines 17-26, in parallel].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

q) **Regarding to Claim 17**: **Lyles** and **Honig et al. disclosed** most of claimed limitations of the claim 17.

Both **Lyles** and **Honig et al. failed to explicitly disclosed** an expression of **1 + CEILING(N/m)** for a multicast packet:

wherein said multicast packet is sent through the switching fabric **1 + CEILING(N/m) times** wherein **N** is the quantity of said multiple outputs, wherein **m** is the quantity of said multiple parallel switching paths, and wherein said **CEILING function** rounds the value of a variable up to the next higher integer. *[However, **Lyles** disclosed a multicast packet is sent through the switching fabric 41 itself for interconnecting a plurality of Virtual Circuit layers within the N x N copy network 48 whenever a copy group is so large that a multi-mode spanning tree is needed to produce the requisite number of cell copies C_j for that particular group. In which, **N/p** is identical line cards (hence N/p is the quantity of multiple outputs) and **p** is lines of p x p crossbar 86 (hence p is number of parallel switching paths); see col.12 line 26 – col.13 line 8].* **Therefore, it would have been obvious** to one of ordinary skill in the art at the time of the invention was made to derive such an expression throughout the N x N copy network 48, N/p line cards and p lines of **Lyles**, as taught by the applicant for a purpose of a calculation of a number of times for a multicast packet, which is sent

through a switching fabric, **the motivation being** able to provide an exactly time delay for a multicast packet successfully transferred through a switching fabric.

r) **Regarding to Claim 18**: **Lyles disclosed** the method of claim 8 wherein said multicast packet is transferred substantially simultaneously to a plurality of said dedicated multicast output cards through said optical switching fabric *[see col.16 lines 36-57, the switch can be used to interconnect successive layers of the copy network 48, multilevel multicast groups in lines 41-43; and see col.17 lines 11-16, k cells can be simultaneously routed]*.

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1**.

s) **Regarding to Claim 19**: **Lyles disclosed** the method of claim 18 wherein said multicast packet is transferred from a plurality of said dedicated multicast input cards to said multiple outputs through said optical switching fabric *[see col.16 lines 6-14, for each of the j cells (copied (multicast) cells), the subsequent processing steps are identical a unicast cell, through the switching fabric 41]*.

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1**.

t) **Regarding to Claim 20**: **Lyles disclosed** the method of claim 19 wherein said multicast packet is transferred to said multiple outputs serially over a period of multiple switching cycles of said optical switching fabric *[see Fig.2, 52, 51 and 45 (these are FIFO buffers; therefore, a multicast would be serially transmitted to the multiple outputs 85);and see col.8 lines 3-68, at the beginning of each arbitration cycle in line 7 and additional switch cycles in line 68 (multiple switching cycles)]*.

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

u) **Regarding to Claim 21**: **Lyles disclosed** the method of claim 19 wherein said optical switching fabric contains multiple inputs and multiple outputs connected through multiple parallel switching paths *[see col.14 lines 42-52, parallel data path structure of the switching fabric 41].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

v) **Regarding to Claim 22**: **Lyles disclosed** the method of claim 21 wherein said multicast packet is replicated to produce a replica packet *[see col.1 line 64 – col.2 line 12, multicast packets, separate copies of each of said packets].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

x) **Regarding to Claim 23**: **Lyles disclosed** the method of claim 22 wherein multiple replica packets are transferred substantially simultaneously in parallel from a plurality of said dedicated multicast input cards to said multiple outputs during a single switching cycle of said optical switching fabric *[see col.17 lines 17-26, in parallel; and see col.17 lines 11-16, k cells can be simultaneously routed].*

It would have been obvious to combine **Lyles** and **Honig et al.** for the same reason as in **Claim 1.**

y) **Regarding to Claim 24**: **Lyles** and **Honig et al. disclosed** most of claimed limitations of the claim 24.

Both **Lyles** and **Honig et al. failed to explicitly disclosed** an expression of **CEILING(M/m) + CEILING(N/(mM))** for a multicast packet:

wherein said multicast packet is sent through said switching fabric **CEILING(M/m) + CEILING(N/(mM)) times**, wherein **N** is the quantity of said multiple outputs, wherein **M** is the quantity of said plurality of dedicated multicast cards, wherein **m** is the quantity of said multiple parallel switching paths, and wherein said **CEILING function** rounds the value of a variable up to the next higher integer. *[However, **Lyles** disclosed a multicast packet is sent through the switching fabric 41 itself for interconnecting a plurality of Virtual Circuit layers within the N x N copy network 48 whenever a copy group is so large that a multi-mode spanning tree is needed to produce the requisite number of cell copies Cj for that particular group. In which, **N/p** is identical line cards (hence N/p is the quantity of multiple outputs) and **p** is lines of p x p crossbar 86 (hence p is number of parallel switching paths); see col.12 line 26 – col.13 line 8].* **Therefore, it would have been obvious** to one of ordinary skill in the art at the time of the invention was made to derive such an expression throughout the N x N copy network 48, N/p line cards and p lines of **Lyles**, as taught by the applicant for a purpose of a calculation of a number of times for a multicast packet, which is sent through a switching fabric with a multiple of multicast cards, **the motivation being** able to provide an exactly time delay for a multicast packet successfully transferred through a switching fabric.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Anthony T Ton** whose telephone number is 703-305-8956. The examiner can normally be reached on M-F: 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W Olms can be reached on 703-305-4703. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ATT

KENNETH VANDERPUYE
PRIMARY EXAMINER